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Warning Signs and Symptoms

- Aircrew Trapped in Aircraft
- Fuel / Oil Floating on Water
- Cloud Emanating from Wrecked Aircraft
- Aircraft Reference Data Lists Hazardous Materials for Aircraft Type
- Rescue Personnel Not Trained In Aircraft Rescue
- Lack of Aircraft Extraction Tools
- Lack of Aircraft Extraction Techniques
- Sense of Urgency to Do Something
- Ejection Seats or Explosive Protective Equipment on Aircraft
- Sharp Edges / Exposed Metal

Causes

- Rescue Personnel and / or Aircrew Injured Due to Aircraft Unique Environment

Potential Effects

- Death, Cuts, Burns, Trauma

Mitigation

- Reference Data for Type of Aircraft Stored As Part of Response Equipment
- Aircraft Familiarization Training On Expected Aircraft Types
- Rowing Operations Used As Needed in Fuel / Oil on Water Environment
- Gas Detection Equipment Available As Needed
- Proper PPE Used - Helmet, Eye Protection, Leather Gloves, Dry Suit, Nomex Undersuit
- Technical Resource Available Trained in Aircraft Entry and Extraction Techniques
- Non-Sparking Tools Used as Needed
- Explosion Proof Radios Used As Needed
- Will Not Attempt Rescue Under Hazardous Fire Conditions (Rescuers in Danger)
- DART Water Rescue Will Not Attempt Aircraft Rescue Outside of Training / Resources
- Air Show Operational Pre-Planning With Moffett Fire Dept.
- Joint Training With Moffett Fire Dept
- Decon Available from Standby Hazmat Team
- Will Not Intentionally Submerge Rescuer Outside of Trained Techniques
- 2nd Boat Standoff As Backup / Support As Needed
- Decision on Body Recovery vs Rescue Early

**Tasks Needed**

- Moffett Fire Provides - Resources / Reference Material for Aircraft Extrication
- Moffett Fire Provides - Aircraft Familiarization Training
- Moffett Fire Provides - Aircraft Extrication Tools
- DART Water Rescue - Water Rescue Related Equipment
- DART Water Rescue - Water Rescue Safety Training
- DART Water Rescue - Water Transport and Trained Resources

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Warning Signs and Symptoms

- Helicopter Operating In Area
- Transport to Scene by Helicopter
- Flood Area
- Military Operations in Area
- People Not Trained In Helicopter Operations
- Using Non-Improved Landing Site (Non Airfield)

Causes

- Helicopter Blades Strikes Person, Downwash Throws Debris or Crash

Potential Effects

- Death, Minor Injury From Debris, Loss of Equipment (Blown Away)

Mitigation

- Annual Helicopter Awareness Training
- Helicopter Operations Training for Some People on Team
- Annual Practice of Helicopter Operations Techniques
- Preplanning of Landing Site Setup and FOD Removal
- Obtain and Train With Helicopter PPE (Goggles, Ear Plugs, ...)
- Practice Navigation Location Finding for Marking Landing Zone
- Don't Use Helicopter Unless Have To
- Safety Briefing Card / Checklist on Aircraft Safety (Crew Chief Goes Over Before Flight)
- Stake / Lanyard All Equipment Down Near Landing Zone
- Remove All Unnecessary Personnel or Gear From Landing Zone
- Protected Waiting or Pre-board Area Near Landing Zone
- Practice Using Standard Hand Signals and Standard Ground to Air Signals
- Preplanning on Crash Situations (Meet-up Location, How Get Out of Aircraft)
- No Operations Aft of Aircraft Centerline (Tail Rotor)
- No Part of Item Carried Above Shoulder Level (Main Rotor Strike)
- Training With USCG on Helicopter Operations
  
- Safety Briefing Card (Questions to Ask) on Helicopter
- Preplanning of Landing Site Setup and FOD Removal
- Training / SOP for Landing Site

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Warning Signs and Symptoms

- Flood Area
- Poor Organization At Logistics Area
- Lack Of Good Water Source
- Empty Water Supplies on Hand
- Laxity in Sanitation

Causes

- Rescuer Ingests Contaminated Food or Water

Potential Effects

- Disease, Food Poisoning, Medical Problems

Mitigation

- Clean and Fill Water Assets Before Deployment
- Water Containers Washed Before Used Again If Needed
- Sealed Water Bottles Located on Assets
- SOP for Logistics Area / Camp Layout
- Regular Team Training Include Cooking, Food and Water Prep
- Hand Pump Water Filter Taken on Deployments As Primary Backup
- Iodine Tablets Used On Deployment With Primary Backup
- Portable Sink Used for Washing Hands Before Touching Food
- Storage of Sealed Meals in Response Trailer
- Cleaning Supplies Carried in Response Trailer
- Portable Toilet Carried in Response Trailer on Deployment Off Center
- Portable Shower Carried in Response Trailer on Deployment Off Center
- Use of Eating Utensils During Meals on Deployment Off Center

Tasks Needed

- Water Containers Needed
- Pack Response Trailer With Supplies
- SOP for Logistics Area / Camp Layout
- Regular Team Training Include Cooking, Food and Water Prep
- SOP for Logistics Area / Camp Layout
- Iodine Tablets Used On Deployment With Primary Backup

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Warning Signs and Symptoms

- Lack of Easily Available Water
- Hot or Changing Weather Conditions
- Very Dry or Humid Weather
- Personnel in Dry Suits or Wet Suits
- Exertion Over Long Periods
- Lack of Regular Rest Breaks
- Out of Camp Area for Extended Time
- Sun Exposure
- Lack of Layers to Add / Remove
- Tired Personnel
- Lack of Air Circulation

Causes

- Body Temperature Above Normal

Potential Effects

- Heat Related Injuries, Poor Coordination / Judgement, Increased Risk of Other Injury

Mitigation

- Water Easily Accessible (On Each Person, In Each Asset)
- Regular Scheduled Breaks
- Dress in Layers (Risk vs Gain for PPE and Heat)
- Regular Scheduled Shifts or Work Periods
- Plan for Weather and How It Will Effect People
- Log Time in Dry Suits
- Check for Urinating, Body Temp, Fatigue During Breaks (LOC is Late Sign)
- Briefing / Checklist on Equipment and Conditions Before Leave Camp
- Rehabilitation Area Set Up - Personnel Monitored in Rehab Area
- Camp Set Up Out Of Direct Sunlight Not On Asphalt
- Practice Using PPE During Hot, Cold, Day, Night in Varying Temperatures
- Camp Set Up In Area With Air Circulation
- Monitor Vital Signs for Personnel
- Sports Drink Available for Replacing Electrolytes
- Arrange for Shower to Cool Off
- Contingency Plan for Evacuation of Hyperthermic Person

Tasks Needed

- Water Added to Assets
- Chart on Medical Conditions Including Time Logged in Drysuit
- Medical Monitoring Sheet

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## Warning Signs and Symptoms

- Lack of Easily Available Food and Water
- Cold or Chilly Weather (Especially Changing Temperatures)
- Wet Weather
- Personnel Wet or Working In Water
- Exertion Over Long Periods
- Lack of Regular Rest Breaks
- Out of Camp Area for Extended Time
- Night
- Lack of Layers to Add / Remove
- Tired Personnel
- Wind
- Personnel Sweating

## Causes

- Body Temperature Drops Below Normal

## Potential Effects

- Cold Related Injuries, Poor Coordination / Judgement, Increased Risk of Other Injuries

## Mitigation

- Water Easily Accessible (On Each Person, In Each Asset)
- Regular Scheduled Breaks
- Dress in Layers and Have Additional Clothes Available
- Regular Scheduled Shifts or Work Periods
- Plan for Weather and How It Will Effect People
- Log Time in Water and Spray Conditions
- Check for Sweating - Especially on Cold Windy Nights
- Briefing / Checklist on Equipment and Conditions Before Leave Camp
- Rehabilitation Area Set Up - Personnel Monitored in Rehab Area
- Cots and Good Sleeping Bags for Overnight
- Practice Using PPE During Cold - Day, Night in Varying Temperatures
- Put Up Camp In Area Protected From Wind
- Regular Meals and Snacks Available in Field
- Contingency Plan for Evacuation of Hypothermic Person
- Wind Protection for Personnel Classified as Rescue Swimmers
- Blankets or Extra Warm Clothing Carried on Boats When Not Operating Close to Shore
- Medial Treatment / Prevention SOP of Hypothermia

## Tasks Needed

- Water Added to Assets
- Chart on Medical Conditions Including Time Logged in Drysuit

## Lost

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## Warning Signs and Symptoms

- Night or Low Visibility Conditions
- Unfamiliar Area
- Rushed Operations
- Lack of Planning Time / Area Available
- Lack of Maps / Charts Available
- Slow or Poor Use Of Navigation Equipment
- Poor Radio Communications
- Poor Lighting Available
- Tired Personnel
- Navigation Not Assigned to Person
- Cold and Wet Conditions
- Lack of Significant Landmarks

## Causes

- Person / Group Loses Direction of Travel or Current Location

## Potential Effects

- Trapped, Cutoff, Ineffective Group, Increased Risk of Other Injury

## Mitigation

- Compass in Fanny Pack for Each Person
- Preplanning With Designated Areas for Search
- SOP on Regular Call in On Location (Progress, Conditions, ...)
- Navigation Training on Map and Compass
- Navigation Training on GPS Units
- Predeployment Briefing Including Landmarks, Directions, ...
- Designate Competent Person For Navigation
- Laminated Charts / Maps on Scene
- Preplanning With NASA Dispatch on Salt Pond Designations
- Map of Aerial Photos of Moffett Field Response Area
- Navigation Practice in Day / Night Conditions
- Training / Testing on Reading NOS Charts
- Easy to Find and Safe Access Regathering Point for Lost / Separated
- SOP on Lights (Flashlight, Headlamp, Chemlight) for Night Operations
- Trail Marking for Overland Navigation (Colored Tape, Chemlights, Chalk, ...)
- At Night Light Up Campsite for Direction Indicator
- Local Training On Area Familiarization of Local Area

## Tasks Needed

- Designated Person For Navigation
- Laminated Maps / Charts
- Compass in Fanny Pack for Each Person
- Campsite Identification Method (in SOP on Campsite Setup)

## Loss of Communications

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Warning Signs and Symptoms

- Old or Uncharged Batteries
- Radios Turned On for Long Time
- Dropped, Soaked or Abused Radio
- Loud Conditions
- Out of Area Deployment
- Long Distance Between Radios
- Hilly Terrain
- Poor Pre-Planning On Mission
- Hurried and Confused Departure From Camp Area

Causes

- Radios Unable to Operate, Unable to Use Signals

Potential Effects

- Confusion, Loss of Safety Backup, Poor or No Coordination

Mitigation

- Spare Battery (AA) Pack Carried With Radios
- AA Batteries Used In Headlamps, Small Flashlights, GPS Units
- Spare AA Batteries Carried in Fanny Packs
- Regular Use of Radios in Training
- Charging Station in Shallow Water Trailer
- Cigarette Lighter Adapter for Charging Radios in Car
- Training on Using Hand Signals
- Separation Between Team Members Limited to Visual Range When Able To
- Communications Set Up on High Point
- SOP on Regular Call in / Checkin
- Training / Testing Of Radios in Water (Submerged)
- Radios Stored With Full Charge
- New Batteries Available for Deployment
- Cache of Spare Batteries in Shallow Water Trailer

Tasks Needed

- Radios Stored With Full Charge
- Training / Testing Of Radios in Water (Submerged)
- Spare AA Batteries Carried in Fanny Packs
- SOP on Camp Setup - High Point or Good Communication Area

## HAZMAT in Working Area

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### Warning Signs and Symptoms

- Flood Area
- People Live or Work in Area
- Known Local Hazmat Problems / Storage
- Abandoned Vehicle / Structures
- Agricultural Area
- Water Treatment Facility
- Bay or Salt Ponds
- Fuel Spill in Area

### Causes

- Toxic Materials Released Into Water - Gets on Personnel

### Potential Effects

- Skin Irritation, Health Problems, Contaminated Equipment

### Mitigation

- Hazmat Team Nearby / Dispatched At Same Time
- Portable Sink in Shallow Water Trailer
- PPE for Contaminated Water (Dry Suits)
- Supply of Clean Water for Washing
- Well Organized Camp (Clean)
- SOP on Decontamination Guidelines
- Regular Medical Check on Rescuers
- Cleaning Supplies for Equipment In Shallow Water Trailer
- Water Sample Kit for Testing Exposure to Chemicals
- Annual Training on FRO and FRO Decon
- Designated HAZMAT Trash Bin
- Hepatitis A Vaccinations Required for Deployment
- Body / Hand Wipes in Shallow Water Trailer

### Tasks Needed

- Camp Layout Scheme
- Cleaning Supplies for Equipment In Shallow Water Trailer
- HAZMAT Trash Bin
- Preplanning on Salt Ponds / Bay With DART Hazmat